

**A16.D16, A32, D64 and GPIO 32**  
**Network I/O**  
**User Guide**  
Revision: 1.2



**Solid State Logic**  
OXFORD • ENGLAND

# Solid State Logic

O X F O R D • E N G L A N D

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E&OE

May 2021

## Document Revision History

|                      |                               |                |
|----------------------|-------------------------------|----------------|
| <b>First Version</b> |                               | September 2018 |
| <b>Revision 1.1</b>  | Addition of GPIO 32           | December 2018  |
| <b>Revision 1.2</b>  | Network I/O Controller update | May 2021       |

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### Introduction

#### Overview

A16.D16, A32, D64 and GPIO 32 are 2U Dante I/O devices featuring high-density combinations of SuperAnalogue™, AES3 and GPIO connections. All analogue audio, AES audio and GPIO connectors are 25-pin D-type.

A16.D16, A32 and D64 can be controlled remotely from SSL System T consoles, SSL Live consoles and SSL's Network I/O Controller app for PC.

A16.D16 is a 32-input and 32-output Dante I/O device featuring 4 SuperAnalogue mic/line inputs, 12 SuperAnalogue line inputs, 8 AES3 inputs, 16 SuperAnalogue line outputs, 8 AES3 outputs and 4 GPIO connections.

A32 is a 32-input and 32-output Dante I/O device featuring 32 SuperAnalogue line inputs and 32 SuperAnalogue line outputs.

D64 is a 64-input and 64-output Dante I/O device featuring 32 AES3 inputs and 32 AES3 outputs.

These units are ideally suited for bulk analogue and AES I/O connections from control or machine rooms, featuring a high-density combination of analogue and digital inputs and outputs, GPIO, redundant power and network connections.

GPIO 32 is a 32-input and 32-output GPIO device which connects over a Dante network and can be controlled remotely from SSL System T consoles. It facilitates a variety of possibilities and applications for System T consoles, such as custom user key panels or complex Audio Follow Video setups. When coupled with System T's powerful Event Manager, GPIO 32 has endless possibilities for custom console functions and external triggers.

### Key Features

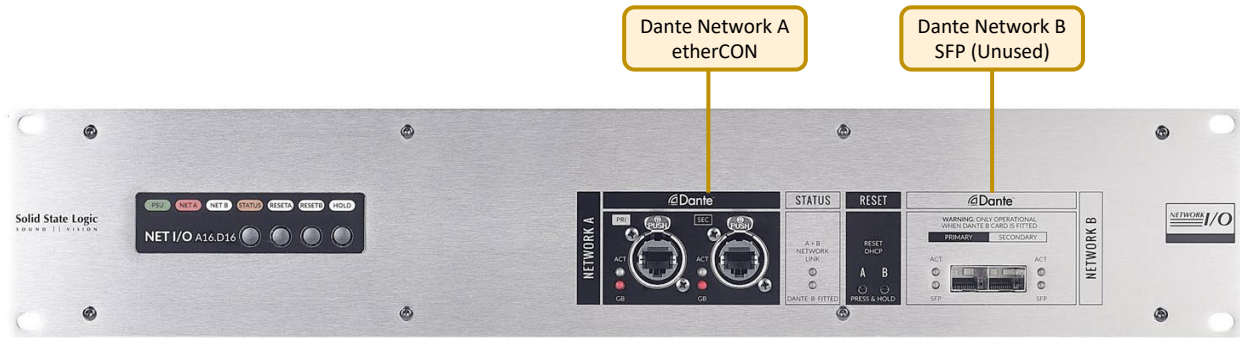
- Interface between control/machine room analogue/AES connections and IP audio networks using Dante and AES67
- Redundant PSUs and Dante network connections
- SSL SuperAnalogue technology<sup>1</sup>
- Device and parameter ownership assignment to avoid control conflicts
- Front facing Dante network connections
- Rear facing audio and GPIO connections
- Silent operation - no cooling fans

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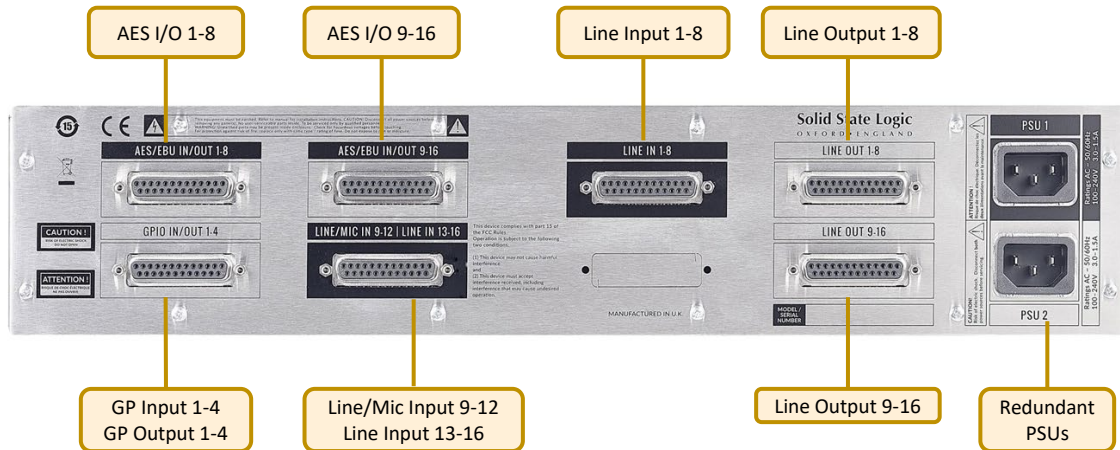
<sup>1</sup> A16.D16 and A32 only



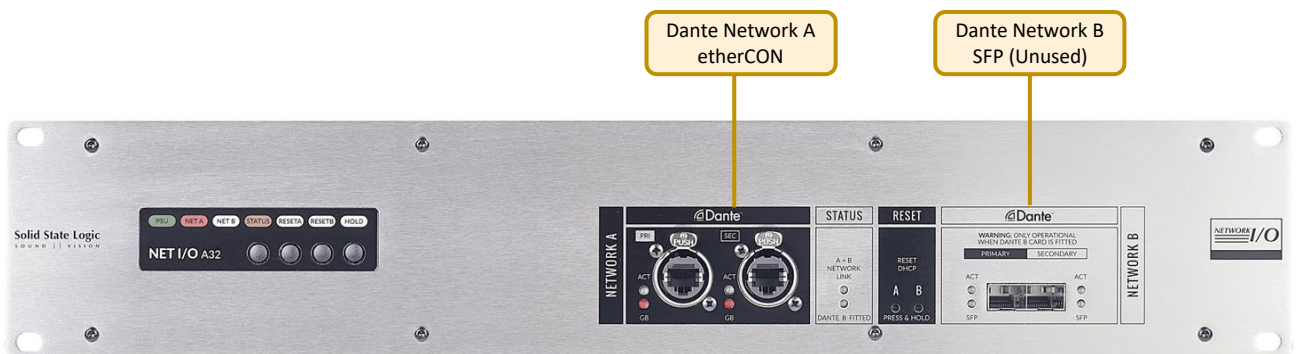
## A16.D16 Front Panel



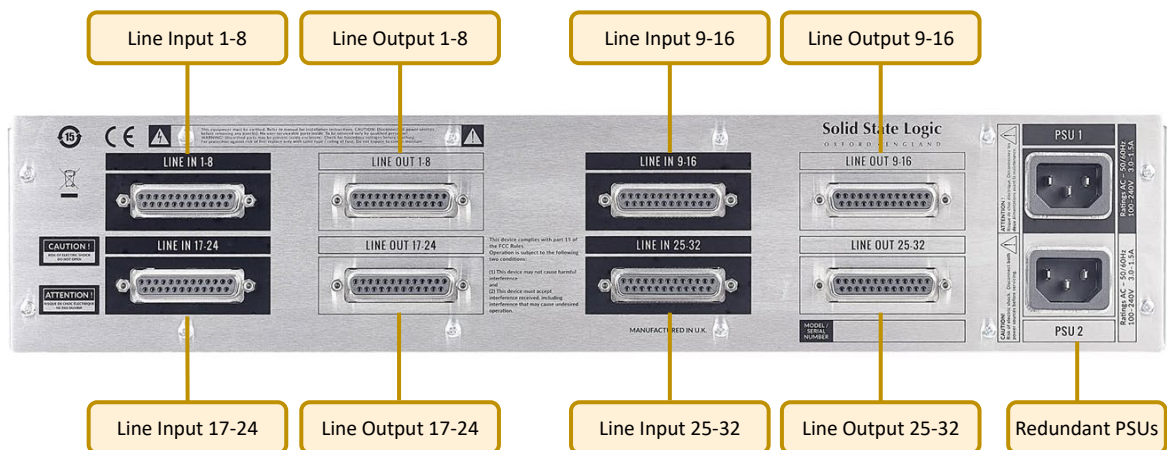
## A16.D16 Rear Panel



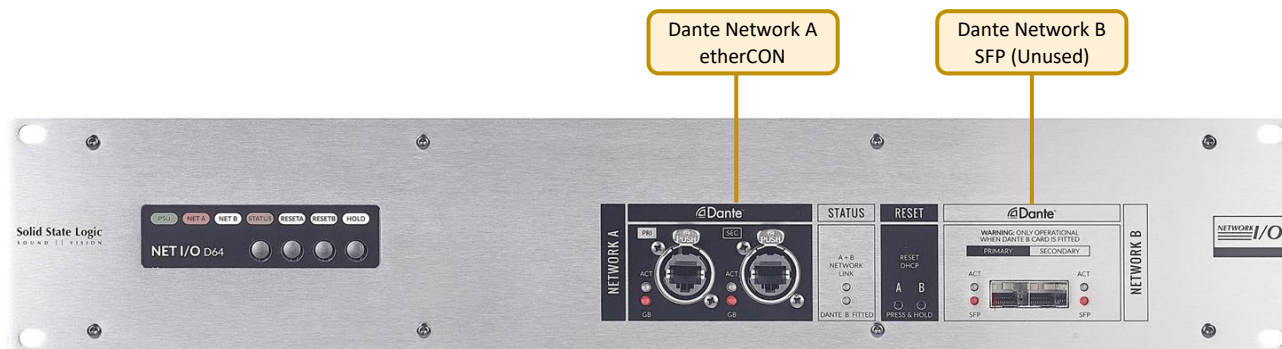
## A32 Front Panel



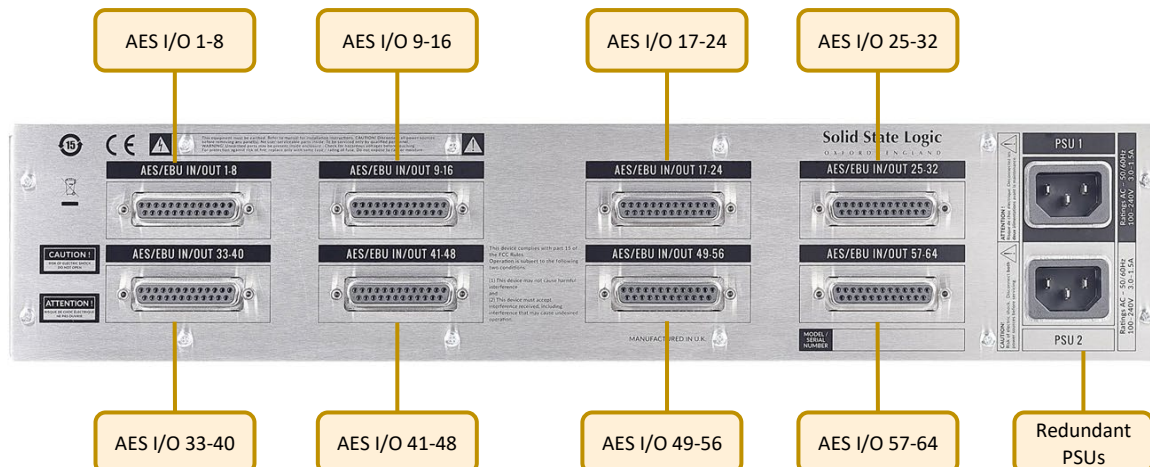
## A32 Rear Panel



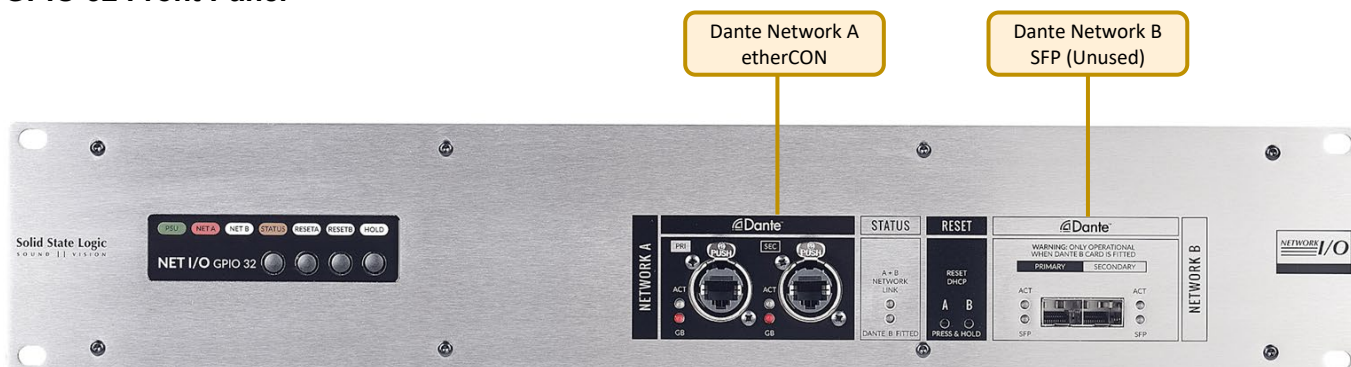
## D64 Front Panel



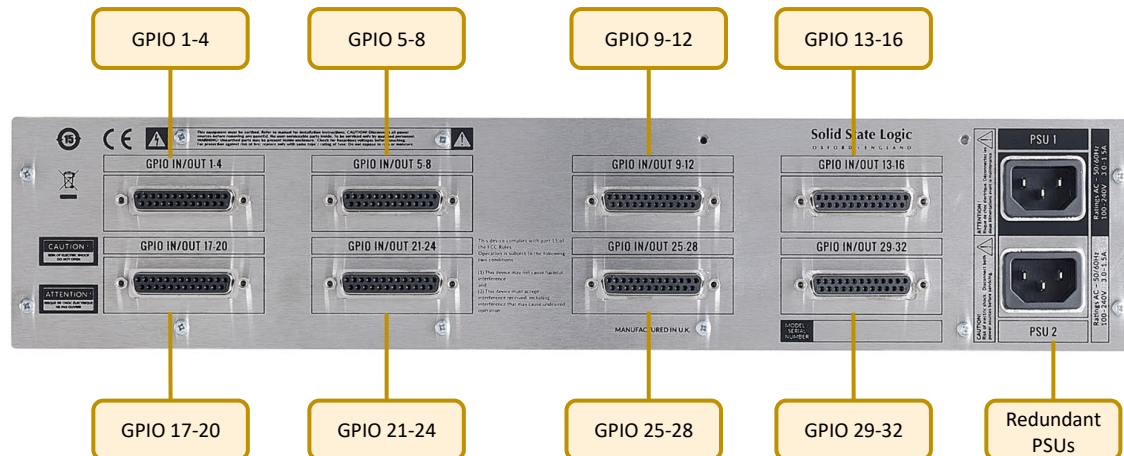
## D64 Rear Panel



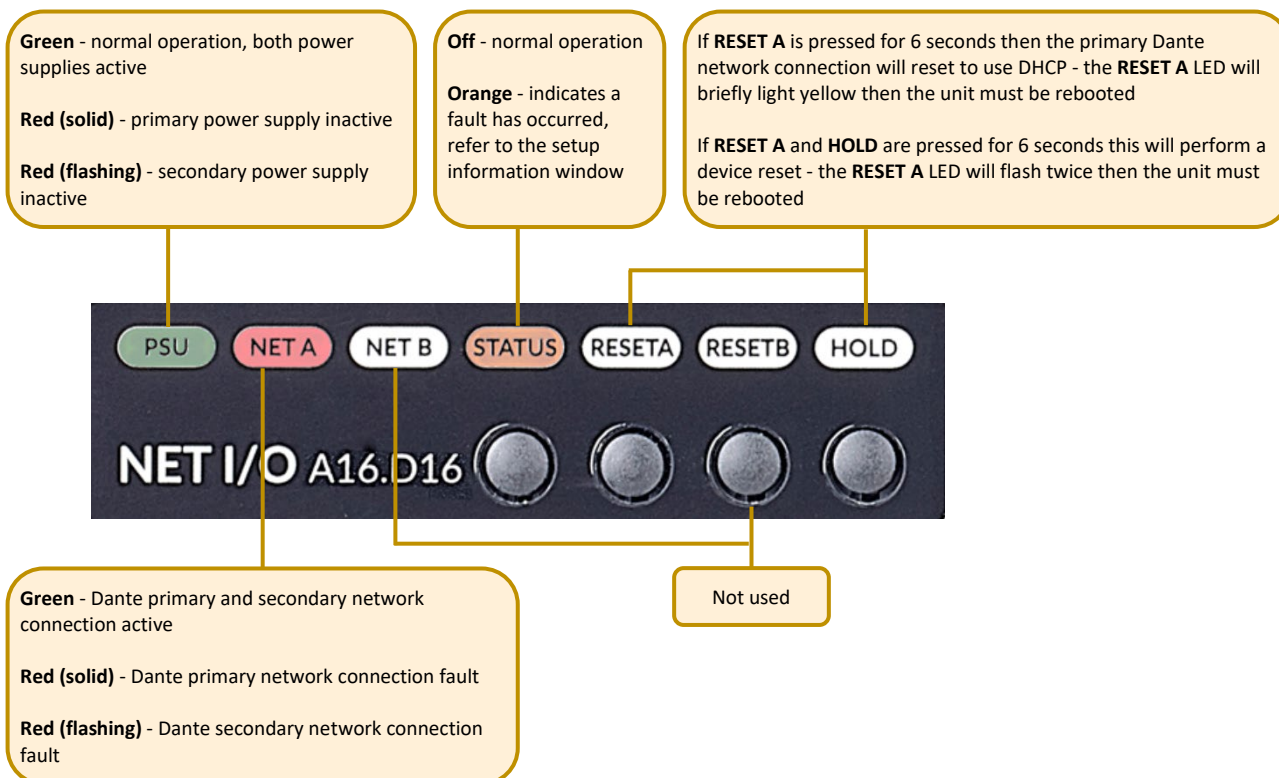
## GPIO 32 Front Panel



## GPIO 32 Rear Panel

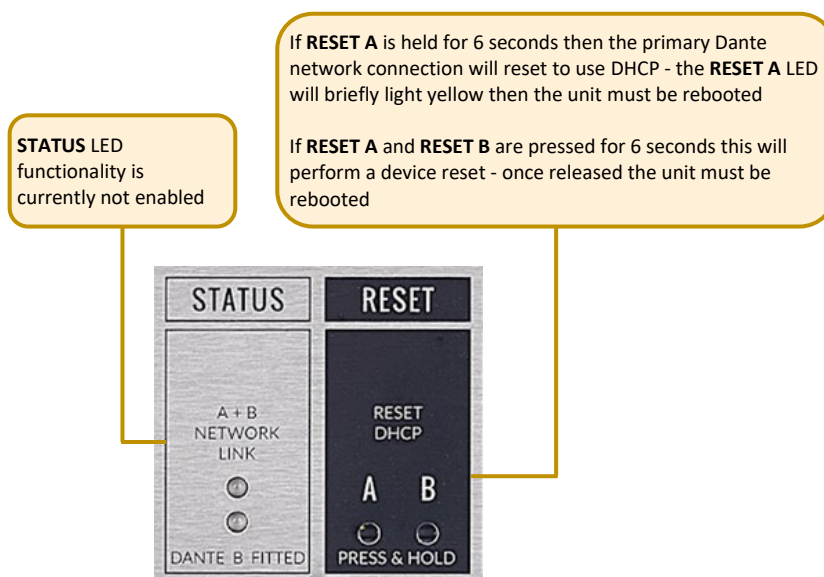


## Status LEDs and User Buttons



## Status and Reset

These reset buttons have the same functionality as the front-facing RESET A and RESET B user buttons.



## Device Reset

Performing a device reset will clear the SSL device settings. This includes ownership, input and GPIO states. This does not clear Dante Brooklyn card settings.

## Brooklyn Reset

Resetting the Dante Brooklyn card to default settings is performed from Dante Controller. Under the 'Device Config' tab for a device select 'Clear Config'. This clears the device name, channel labels, IP address settings, sample rate, latency and existing audio routes. This does not clear SSL Ownership settings.

### *User and Control Bit Pass-Through (A16.D16 and D64 Only)*

To enable the pass-through of AES user and control bits the device must be set to **PCM 32 encoding** within Dante Controller. Changing the encoding setting is detailed in the [Dante Controller](#) section of this guide.

**N.B.** *When set to 32-bit encoding the audio remains 24-bit. The additional 8 bits are used to transport the user and control bits from the AES3 signals.*



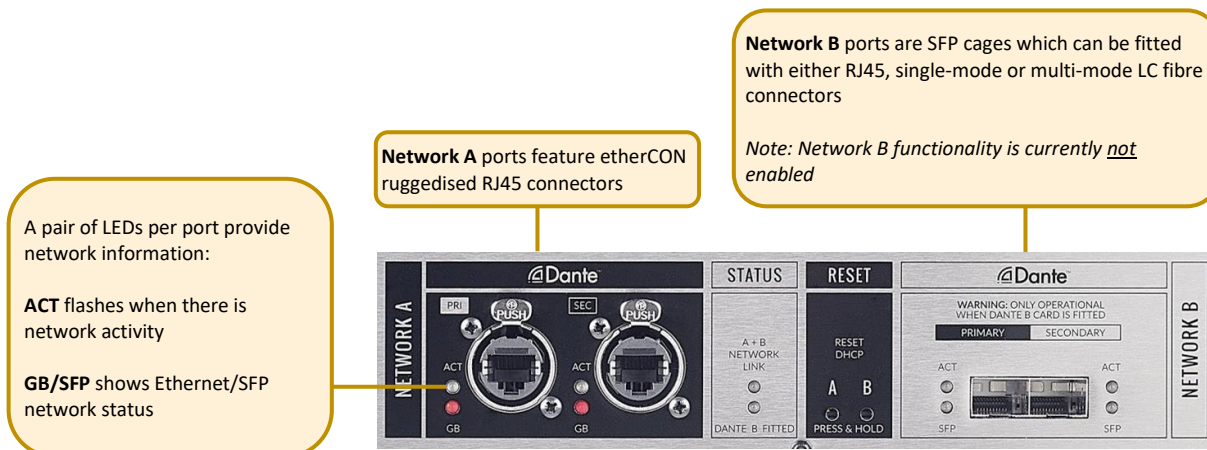
## Hardware Connections

### Mains Power Connections

The A16.D16, A32, D64 and GPIO 32 include redundant PSUs with IEC C14 inlets. Either supply can individually power the unit. Ideally these should be connected to separate power circuits to provide redundancy of incoming AC power.



### Dante Connections



The A16.D16, A32, D64 and GPIO 32 have two redundant sets of network connections. The Network B port connectivity is currently not enabled, this requires an additional Dante card which is currently not available.

### Audio and GPIO Connections

All audio and GPIO connections are via 25-pin D-type connectors.

See [Appendix B](#) for pinout information.



## SSL Network I/O Controller

This section applies to the A16.D16, A32 and D64 only. GPIO 32 cannot be controlled from SSL Network I/O Controller.

### *Installing Network I/O Controller*

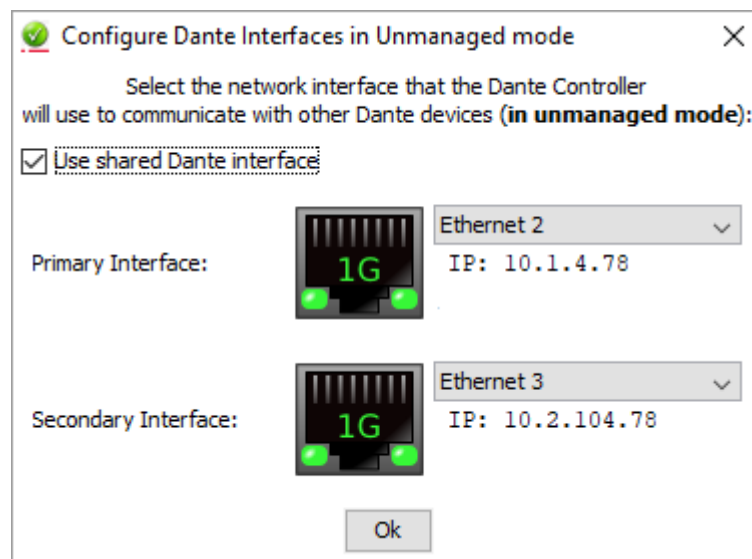
When SSL Network I/O is used without an SSL console, configuration and control is achieved using the SSL Network I/O Controller PC application. This can be downloaded from the [SSL website](#) as part of the Network I/O Stagebox upgrade package or as a standalone installer.

Locate and run the Network I/O Controller installer and follow the on-screen prompts to install the application.

Application data is stored per Windows user account, allowing each user's configuration of device filtering, sorting and application window size to be retained.

### *Network Configuration - PC*

Once Network I/O Controller is installed, connect the Windows PC to the same subnet as the Network I/O. The SSL Network I/O Controller application uses the network adapters configured in Dante Controller for communication. Before starting Network I/O Controller first open Dante Controller and select the network adapters connected to the Dante network. 'Use shared Dante interface' must be selected to ensure all applications using the Dante network use the correct adapters. Subsequent changes to network settings may require Network I/O Controller to be restarted.

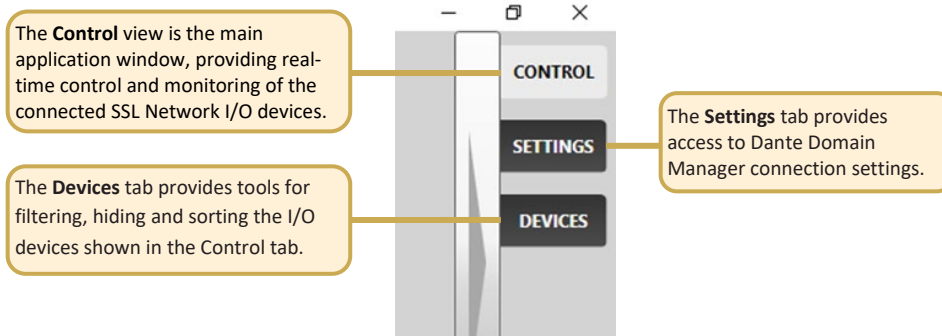


TCP/IP is used to communicate with the unit, so check Windows firewall settings if communications are not working.

Set the computer to 'Never Sleep' to maintain communication.

## Application Navigation

Network I/O Controller is divided between three tabs: **Control**, **Settings** and **Devices**. These are accessed from the right hand side of the application.

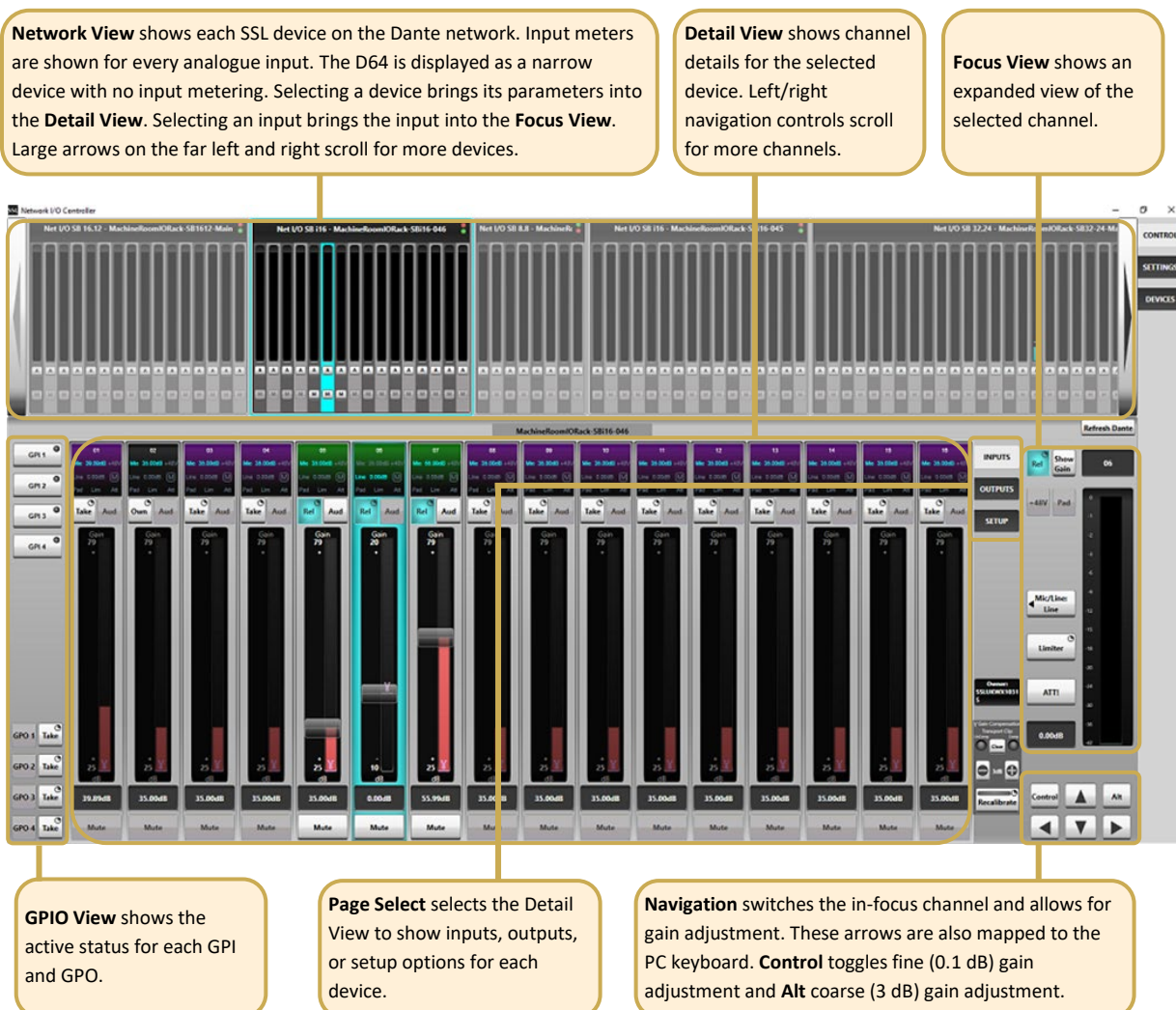


The application can be resized horizontally and vertically to fit the display as desired. Click and drag from the side or corner of the application to resize. With the **Control** tab visible, increasing the window width allows more devices and input metering in the **Network View**, plus displays more channels for control in the **Detail View**. Increasing the window height provides larger metering in **Network View** and a longer fader for each input in the **Detail View**.

When set to full screen on a 1920x1080 display 16 channels are displayed in the **Detail View**.

## Control View

The **Control** tab is divided into five sections:



## Network View

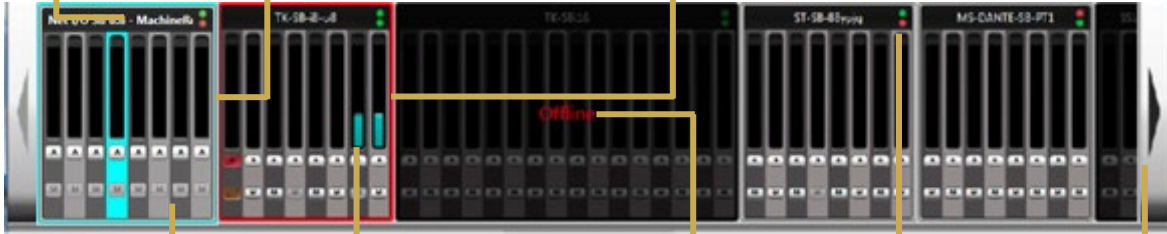
**Device Name** is set within Dante Controller.

**Selected device** is highlighted with a cyan outline. Devices and channels can be selected from here or with the scroll arrows.

A **Red Highlight** indicates a device that requires operator action:

- A flashing red background indicates a device with a clipping audio channel
- A solid red border highlights a device with an active Attention flag

If the device requiring attention is not already visible in the Network View window, then the appropriate large scroll arrow will show red to direct you to the appropriate device.



**Att and Mute** tallies show the status of these functions for every stagebox channel.

The **Level Meter** shows the real-time signal level for all analogue input channels. A red clipping indicator is also provided.

Greyed out devices marked **Offline** are 'known' to the network but unreachable, typically switched off.

**PSU Tallies** show the status of PSUs 1 and 2 for each stagebox.

**Scroll arrows** are used to navigate between devices. A black arrow indicates further devices are available.



## Inputs/Outputs

Select the **Inputs**, **Outputs** or **AES I/O** tab in the Page Select area to view I/O available on the network.

## Analogue Inputs

This applies to the A16.D16 and A32 only.

**Control Status** shows whether the viewer has control of the input's parameters. Each individual channel has independent ownership.

**Rel** in cyan indicates that this input is under the control of the viewer. Press and hold to relinquish control.

**Take** indicates that this input is NOT under the control of the viewer. Press and hold to take control from the owner.

**Own** indicates that this input is not owned by any controller. Press and hold to take ownership of this input.

**Show Gain** toggles the fader into the Focus Window. Gain can be controlled via mouse, keyboard, or numeric entry.

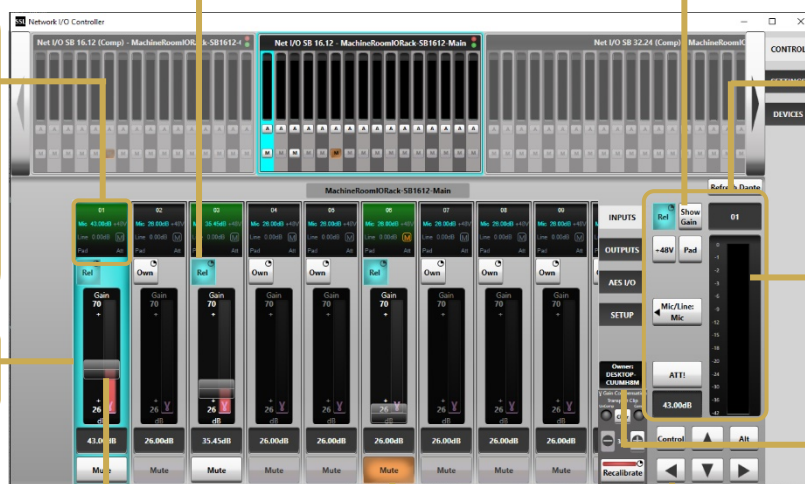
**Channel Info** shows all parameters of the channel at a glance. The background colour indicates ownership status: green for owned inputs, purple for inputs owned by another controller and black for unowned inputs.

**Selected Channel** is highlighted in cyan.

**Focus Window** displays the available parameters for the selected channel.

**Level Meter** shows the signal level for the selected channel. A red clipping indicator is also provided.

**Ownership window** displays the owner of the selected channel.



**Fader** allows for manual level control via the slider, keyboard arrow keys, or numeric entry by clicking the text Gain Value box.

**Fader Level Bar** is coloured red on microphone input channels and cyan on line level inputs.

**Mute** mutes the input or output channel. The mute state is stored in volatile memory on the unit and all channels will reset to unmuted if the unit is repowered.

**Left and Right** arrows switch the selected channel. **Up and Down** arrows adjust the gain for the selected channel in discrete 1dB steps. **Control** toggles fine (0.1 dB) gain adjustment and **Alt** coarse (3 dB) gain adjustment. These controls are mapped to the computer keyboard.

## Mic/Line Inputs

The following controls are available in the **Focus** window for A16.D16 inputs 9-12 only:

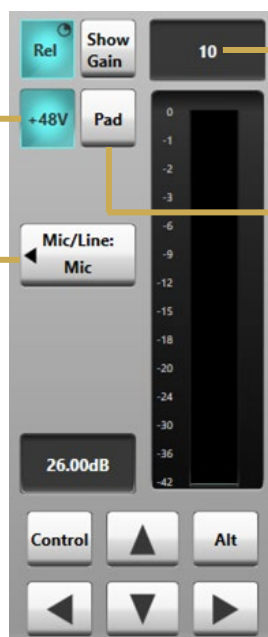
**+48V** toggles the mic preamp phantom power.

Selecting **Line** input will turn off phantom power.

**Mic/Line** toggles the appropriate input gain range and impedance for mic or line level sources.

**Mic** inputs have a gain range of 74dB including the pad. The available range values are dependent on the operating level.

**Line** level inputs have no adjustable gain, they follow the operating level of the unit.

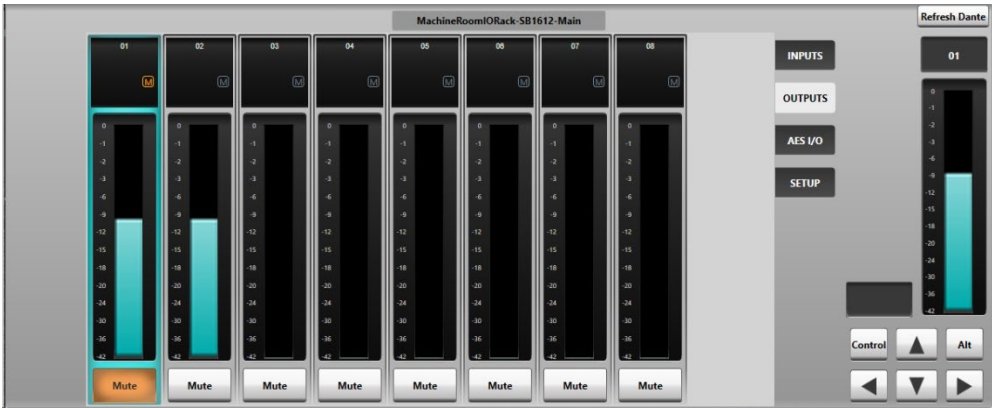


**Channel Label** as entered in Dante Controller.

**Pad** toggles the -30 dB mic preamp pad.

Analogue Outputs

This applies to the A16.D16 and A32 only.



**Mute** allows individual outputs to be muted.

AES I/O

This applies to the A16.D16 and D64 only.

**Control Status** shows whether the viewer has control of the input's parameters. Each individual channel has independent ownership.

**Rel** in cyan indicates that this input is under the control of the viewer. Press and hold to relinquish control.

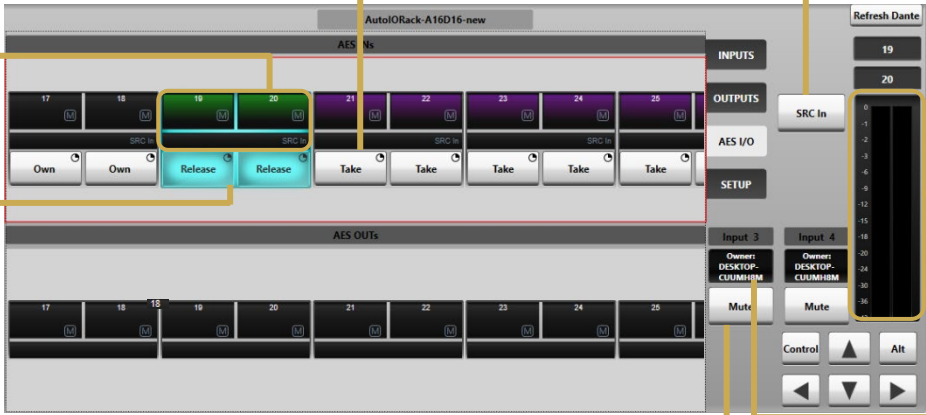
**Take** indicates that this input is NOT under the control of the viewer. Press and hold to take control from the owner.

**Own** indicates that this input is not owned by any controller. Press and hold to take ownership of this input.

**SRC In** enables SRC for the in-focus input channels.

**Channel Info** shows at a glance whether SRCs and mutes are enabled.

**Selected Channel** is highlighted in cyan.



**Level Meter** shows the signal level for the selected channels. A red clipping indicator is also provided.

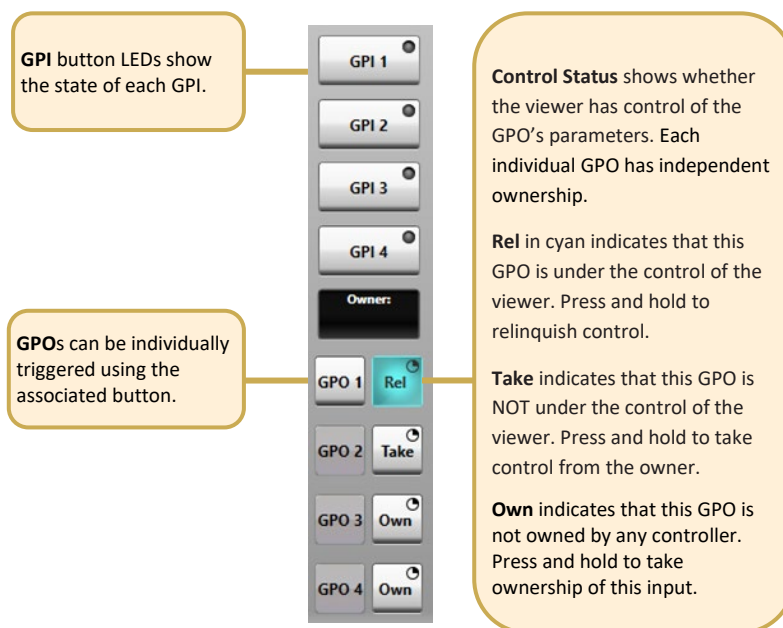
**Ownership** window displays the owner of the selected channel.

**Mute** mutes the individual input or output. The mute state is stored in volatile memory on the unit and all channels will reset to unmuted if the unit is repowered.

## GPIO

This applies to the A16.D16 only. The A16.D16 is equipped with 4 GP input and 4 GP output circuits. Inputs are opto-isolated voltage triggered and output closures are via DIL relay.

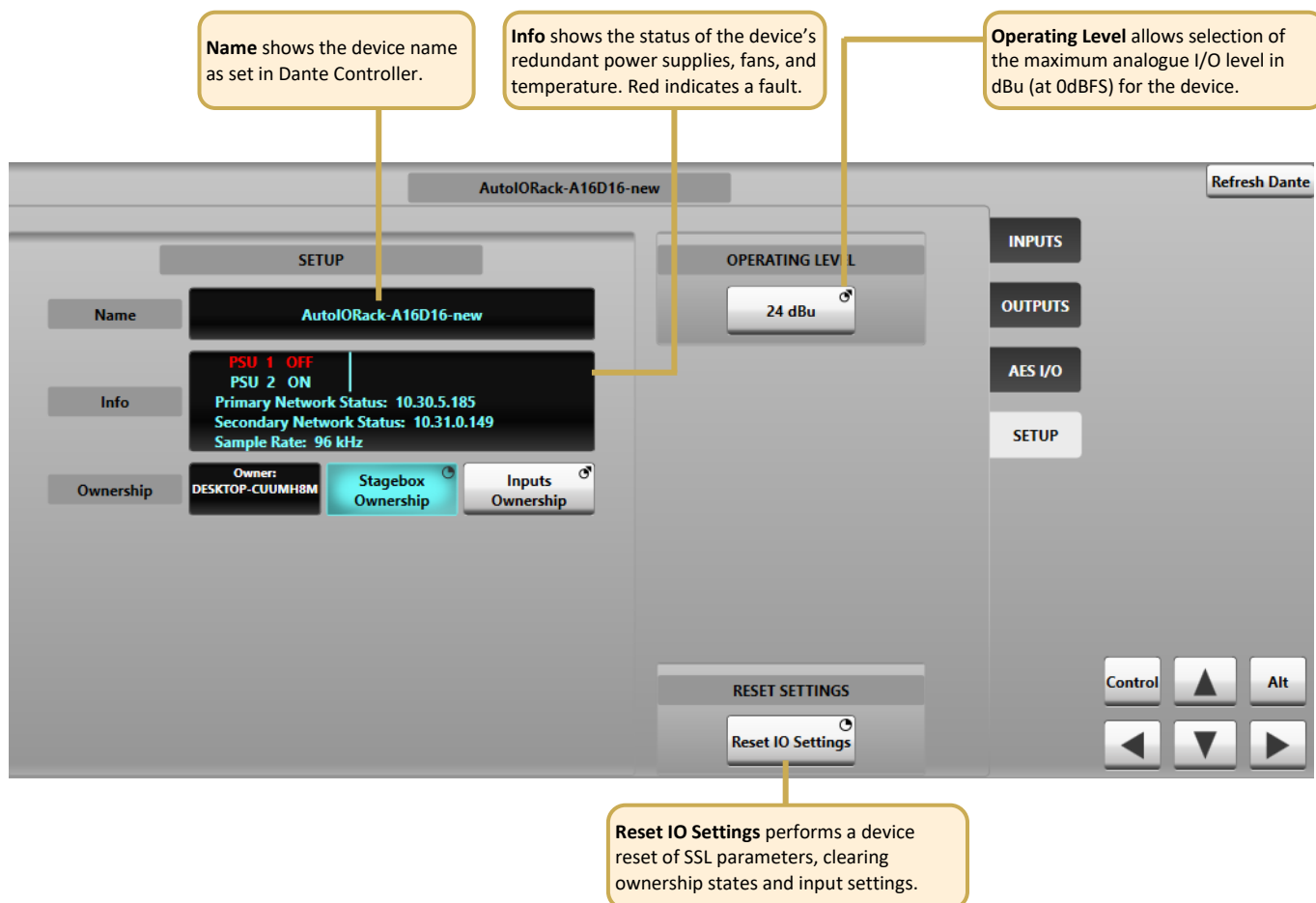
See [Appendix B](#) for connector pinout and contact ratings.



## Setup

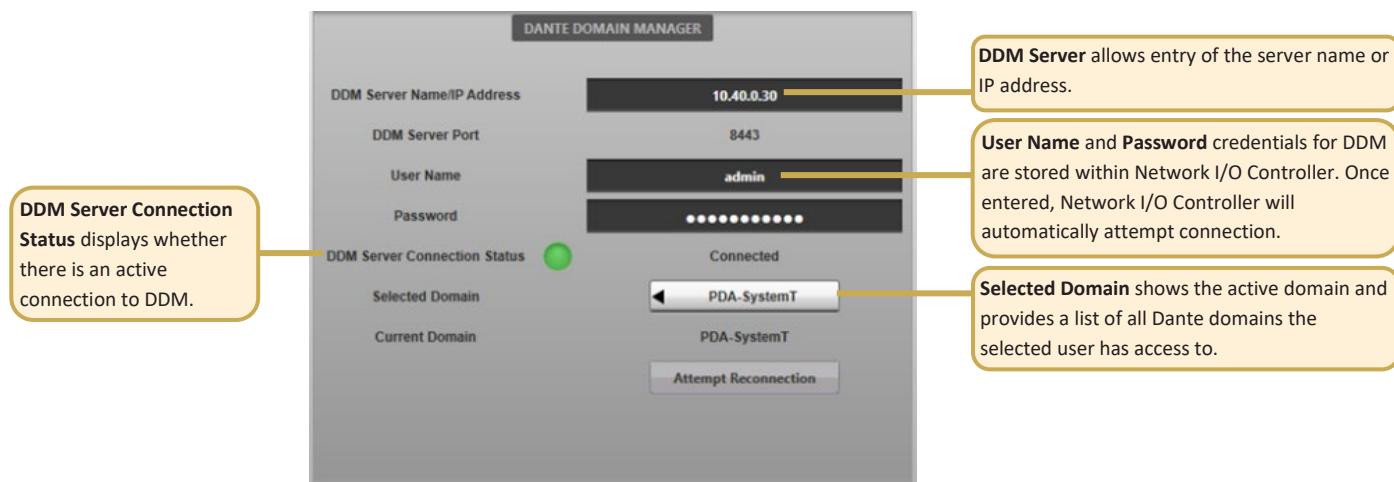
Press **Setup** in the **Page Select** area to display the system configuration information.

**Stagebox Ownership** and **Inputs Ownership** are detailed under [Ownership](#).



## Settings View

For installations using Dante Domain Manager (DDM), the **Settings** tab provides access to DDM connection settings. Network I/O Controller can connect as a control client in the same way that Dante Controller, SSL Live and System T consoles can. Consult the Dante Domain Manager User Guide for further information regarding DDM.





Devices View

The **Devices** tab provides management of the I/O devices displayed in the **Control View**.

**Device Filtering** allows Network I/O device types to be hidden, both from the **Control View** and the **Control View Filtering and Sorting** section. An example use case may be to hide all compensated devices so that the **Control View** only shows the gain tracked signals, not the compensated split feeds.

**Control View Filtering and Sorting** provides control of the order in which devices are displayed in the **Network View** of the **Control View**, in addition to individual device filtering.

**SHOW ALL** clears the currently selected device filters.

**HIDE OFFLINE** ensures only currently connected devices are displayed, irrespective of device type.

**Device Filtering** is provided for all Network I/O device types available in Network I/O Controller. These device types can be pre hidden, so they are not visible from this instance of the software when they are discovered. Device filtering hides the selected device types from the **Control View** and the below **Control View Filtering and Sorting** table.

SHOW ALL

HIDE SB8.8

HIDE SB16

HIDE SB16.12

HIDE SB32.24

HIDE A16.D16

HIDE A32

HIDE D64

HIDE OFFLINE

HIDE SB8.8 (Comp)

HIDE SB16 (Comp)

HIDE SB16.12 (Comp)

HIDE SB32.24 (Comp)

Control View Filtering and Sorting

| Name                           | Device Type     | Description                         | Index | IP Address  | Is Online | Hidden                              |
|--------------------------------|-----------------|-------------------------------------|-------|-------------|-----------|-------------------------------------|
| MachineRoomIORack-SB1612-Comp  | SB 16.12 (Comp) | SB 16.12 B                          | 3     | 10.30.0.159 |           | <input type="checkbox"/>            |
| MachineRoomIORack-SB1612-Main  | SB 16.12        | SB 16.12                            | 2     | 10.30.0.158 |           | <input type="checkbox"/>            |
| MachineRoomIORack-SB32-24-Comp | SB 32.24 (Comp) | SB 32.24 B                          | 11    | 10.30.3.197 |           | <input type="checkbox"/>            |
| MachineRoomIORack-SB32-24-Main | SB 32.24        | SB 32.24                            | 6     | 10.30.3.199 |           | <input type="checkbox"/>            |
| MachineRoomIORack-SB1808-088   | SB 8.8          | 8 I/O Dante Stage Box               | 12    | 10.30.3.213 |           | <input checked="" type="checkbox"/> |
| MachineRoomIORack-SB1808-088   | SB 8.8 (Comp)   | 8 I/O Dante Stage Box (Compensated) | 13    | 10.30.3.213 |           | <input checked="" type="checkbox"/> |
| MachineRoomIORack-SB1808-090   | SB 8.8          | 8 I/O Dante Stage Box               | 7     | 10.30.3.195 |           | <input type="checkbox"/>            |
| MachineRoomIORack-SB1808-090   | SB 8.8 (Comp)   | 8 I/O Dante Stage Box (Compensated) | 8     | 10.30.3.195 |           | <input checked="" type="checkbox"/> |

Column headings can be selected to affect the **Sort Order** of this table and importantly the order in which devices are displayed in the **Network View** of the **Control** tab.

Selecting the heading for a column will set it as the ordering field and toggle between ascending or descending. Sorting can be alpha-numeric by **Name** or **Device Type**, or numerically by **IP address** or **Index** (discovered order).

Individual devices can be **Hidden** from the **Control View**.

## Ownership

Net I/O stageboxes can be controlled by SSL Live or System T consoles and the Network I/O Controller PC application. Separate **Stagebox** and **Input** ownership options are available to prevent control conflicts between networked consoles and control computers sharing resources.

The screenshot shows the 'AutoIO Rack-A16D16-new' control interface. The 'Ownership' section is highlighted, showing the current owner as 'DESKTOP-CUUMHBM'. The 'Stagebox Ownership' and 'Inputs Ownership' buttons are visible. A callout box explains that the current owner is listed in white. Another callout box explains that pressing and holding 'Stagebox Ownership' assigns or relinquishes stagebox ownership. A third callout box explains that pressing and holding 'Inputs Ownership' opens the Ownership menu, which includes options like 'Own All', 'Take All', and 'Release All'.

Press and hold **Inputs Ownership** to open the Ownership menu:

- Own All** will assign all unowned inputs
- Take All** will assign all inputs including those owned by another controller
- Release All** will release ownership of inputs owned by the controller

The current owner is listed in white.

Press and hold **Stagebox Ownership** to assign or relinquish stagebox ownership.

### Stagebox Ownership

Stagebox ownership provides general ownership of the stagebox configuration, covering the following parameters:

- Operating level
- SRC state of AES inputs

A stagebox does not require an owner at all times, so can remain unowned if the above settings do not need to be adjusted.

### Input Ownership

Input ownership offers a level of protection to inputs: when an input is owned the input parameters can only be modified by the device that owns it. Parameters covered by input ownership are:

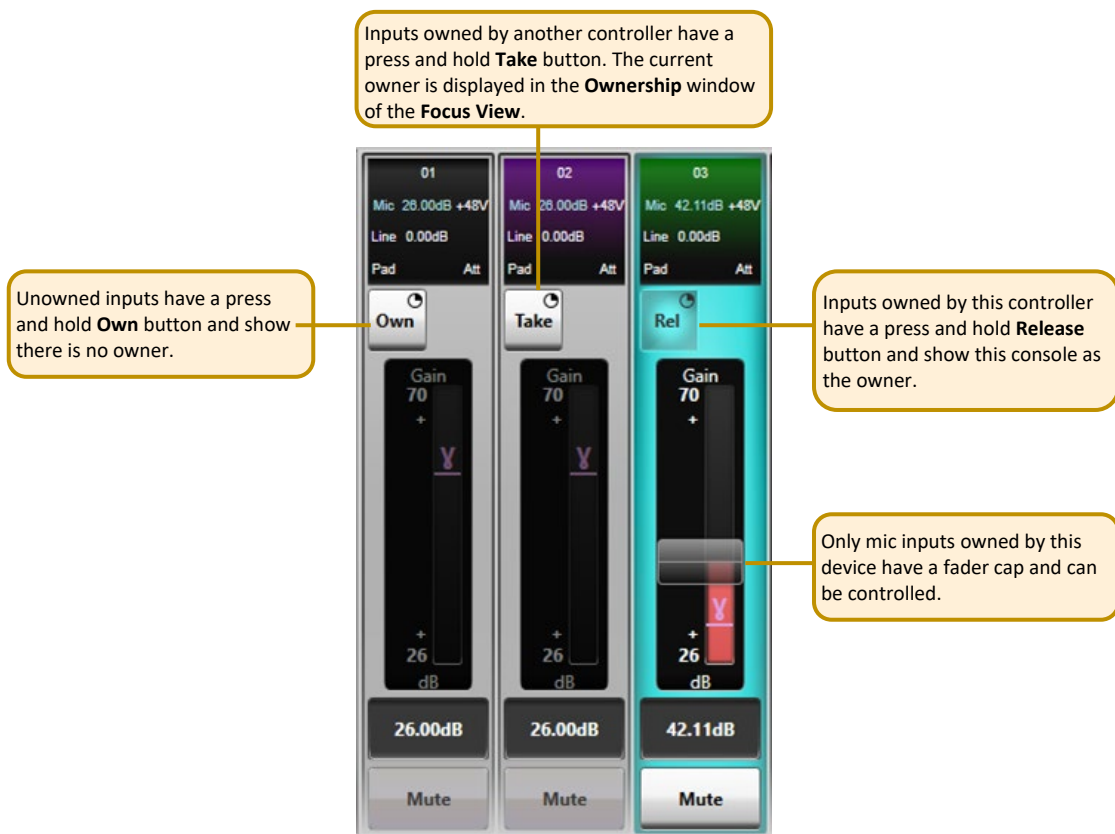
- Mic gain
- Phantom power
- Mic/line switching
- Pad
- Input mute
- SRC (sample rate conversion)

Note that multiple consoles can share the same input signal but only one device can control the input parameters. Altering the input settings will affect all consoles using the input.

N.B. Ownership settings are stored on the A16.D16/A32/D64. The mute state is stored in volatile memory on the unit and all channels will reset to unmuted if the unit is repowered.

### Individual Input Ownership

One of three options will be displayed when an input is selected on a device, depending on the current ownership state. These options are **Own**, **Take** and **Release**:



### Console Routing and Input Ownership

When an SSL console makes routes from a stagebox mic input to a console channel, the console will automatically become the owner of any unowned inputs. If an input is owned by a different controller then routing will not automatically take ownership, **Take** ownership will need to be performed if input control is required on this device. Note that the audio route will still be made regardless of whether ownership is assigned.

When an SSL console unloads a showfile (as happens when a new showfile is loaded or the console is powered down), routes are unmade. Unmaking routes for mic inputs automatically releases ownership, leaving them unowned for the next use. Ownership status is stored on the device, for all controllers on the distributed network to take account of.

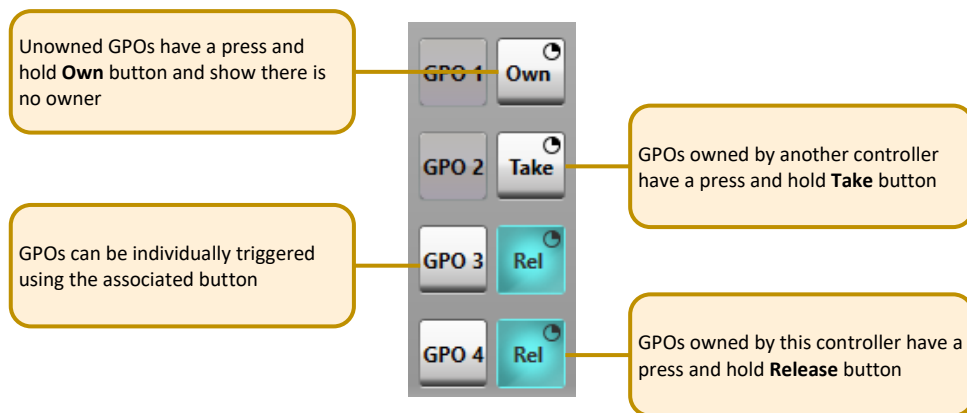
If a stagebox is unreachable (e.g. it has been powered off) when the console showfile is unloaded then the stagebox storage of ownership will persist. If the stagebox is to be used on the same console (or set of consoles with the same showfiles) on next use, this persistence of ownership will not matter. If the stagebox is to be used on a different console, ownership will need to be cleared using **Reset I/O Settings** from console software or Net I/O Controller, or the hardware reset option detailed in [Status and Reset](#).

Ownership from Network I/O Controller is manually controlled. Network I/O Controller does not manage Dante routing, this is done with Dante Controller.

### GPO Ownership (A16.D16 and GPIO 32 Only)

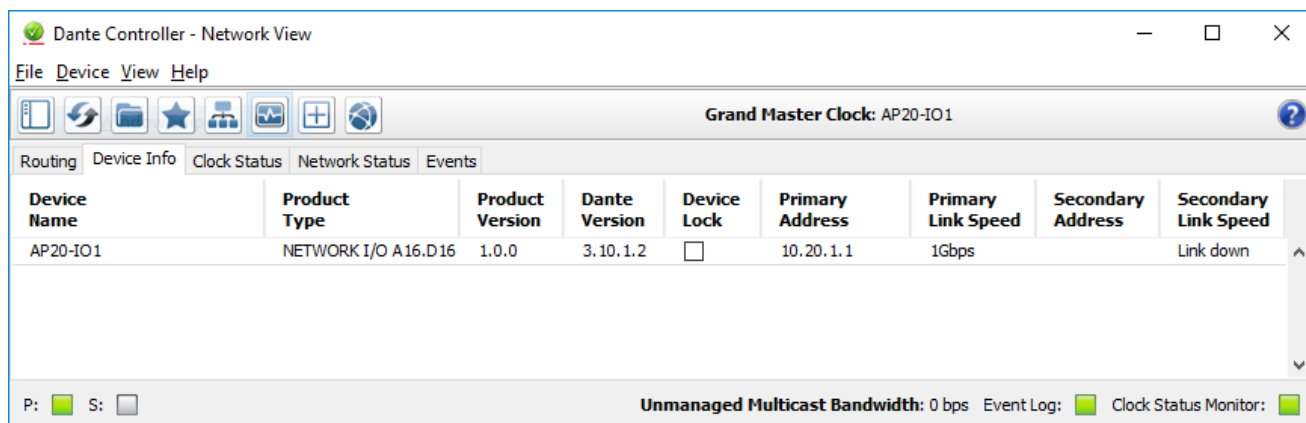
The A16.D16 and GPIO 32 GPO connections also have ownership status. The available ownership states are identical to those for inputs.

N.B. GPIO 32 ownership is only controllable from System T consoles. GPIO 32 cannot be controlled from SSL Network I/O Controller.





## Dante Controller



Refer to Audinate's Dante Controller user guide for complete information on Dante Controller software. The information below details the basics required to get started.

Clock sync, device naming, AES67 configuration and network management are all done within Dante Controller.

Dante utilises the device name for routing. Each device must have a unique name – if a name is duplicated it will be appended with a number.

### Network Config

Each device requires its own unique IP address. This may be automatically configured, provided by a DHCP server or assigned manually. Unless shipped as part of a preconfigured system, Network I/O units are set to obtain an IP address automatically.

If the IP settings need to be changed to a fixed address – to match the network environment in which the unit is to be installed – this can be achieved using the Dante Controller application.

Remember that the computer's network adapter configuration will also need to be updated to match the Network I/O.

The primary and secondary ports must not be connected to the same logical network. Ideally, separate switching hardware should be provided for primary and secondary networks. Creating VLANs on shared hardware is acceptable but does not provide the most robust redundancy.

### Device Info

The **Device Info** tab shows an overview of all devices on the Dante network including name, product type, software version, IP address, link speed and status.

**Device > Device View** provides configuration and diagnostics for each device including Tx and Rx subscription and signal status, software and firmware version information, network utilisation and real-time latency measurement, as well as configuration of device name, sample rate, bit depth, latency, IP address and AES67 parameters. The **Network Config** tab provides IP address configuration options.

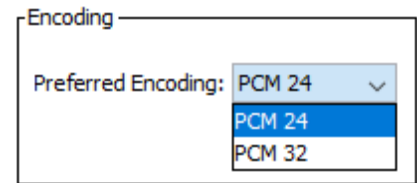
The device will resolve to a link-local address if it is set to obtain an IP address automatically and no DHCP server is present. To access via link-local, set your computer to obtain an IP address automatically, directly connect to the device's primary port and wait for the link-local addresses to resolve. Link-local addresses for the Primary Dante interfaces obtain IP addresses in the 169.254.xxx.xxx range, secondary Dante interfaces obtain addresses in the 172.31.xxx.xxx range.

### *Linking/Unlinking Networks A and B*

Network B functionality is not yet enabled. The Network Config tab within Dante Controller Device View allows for Networks A+B to be linked/unlinked, this currently has no functional effect on the unit.

### *User and Control Bit Pass-Through (A16.D16 and D64 Only)*

To enable the pass-through of AES user and control bits the device must be set to 32-bit encoding (**PCM 32**). This is set within the **Encoding** section of the **Device Config** tab.



## Appendices

### Appendix A – Physical Specifications

| Parameter    | Value                                   | Notes                                      |
|--------------|---|--|
| Depth        | 460 mm (18.11")                         |  |
| Height       | 88.5 mm (1.75")                         | 2 RU                                       |
| Width        | 438 mm (17.25")<br>482 mm (19")         | Excluding rack ears<br>Including rack ears |
| Weight       | 9.5 kg (21 lb)                          |  |
| Power        | < 100 W                                 |  |
| Boxed Size   | 538 x 538 x 228 mm (21.2 x 21.2 x 9.0") |  |
| Boxed Weight | 12.5 kg ( 27.6 lbs)                     |  |

#### *Ventilation*

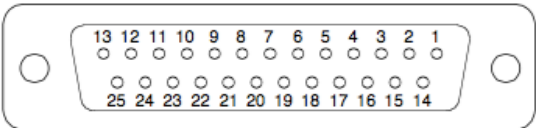
Ventilation is from the side and top of the unit.

**1RU of ventilation must be provided above each unit.**

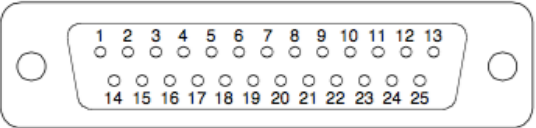
Appendix B - Connector Pin Outs

| Analogue Inputs/Outputs |                 |   |
|-------------------------|-----------------|---|
| Location:               |                 | Rear Panel  |
| Connector Type:         |                 | 25-way D-type female  |
| Pin                     | Description     | Notes:  |
| 1                       | Channel 8 (+ve) | Same circuit arrangement for Inputs and Outputs.<br>Circuits offset by 8 for each additional connector. |
| 2                       | Channel 8 (−ve) |   |
| 3                       | 0 V             |   |
| 4                       | Channel 7 (+ve) |   |
| 5                       | Channel 7 (−ve) |   |
| 6                       | 0 V             |   |
| 7                       | Channel 6 (+ve) |   |
| 8                       | Channel 6 (−ve) |   |
| 9                       | 0 V             |   |
| 10                      | Channel 5 (+ve) |   |
| 11                      | Channel 5 (−ve) |   |
| 12                      | 0 V             |   |
| 13                      | Channel 4 (+ve) |   |
| 14                      | Channel 4 (−ve) |   |
| 15                      | 0 V             |   |
| 16                      | Channel 3 (+ve) |   |
| 17                      | Channel 3 (−ve) |   |
| 18                      | 0 V             |   |
| 19                      | Channel 2 (+ve) |   |
| 20                      | Channel 2 (−ve) |   |
| 21                      | 0 V             |   |
| 22                      | Channel 1 (+ve) |   |
| 23                      | Channel 1 (−ve) |   |
| 24                      | 0 V             |   |
| 25                      | n/c             |   |

Connectors Viewed From Wiring Side



Plug



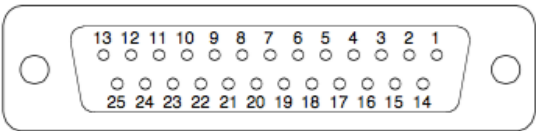
Socket

Dimensions:55 x 15 mm (approx.)  
Cable Diameter:8 mm (typical)  
Screwlock thread:440-UNC

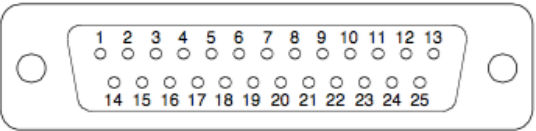


| AES/EBU Inputs/Outputs |                    |   |
|------------------------|--------------------|---|
| Location:              |                    | Rear Panel  |
| Connector Type:        |                    | 25-way D-type female  |
| Pin                    | Description        | Notes:  |
| 1                      | Out channels 7/8 + | Outputs.<br>Circuits offset by 8 for each additional connector. |
| 14                     | Out channels 7/8 - |   |
| 2                      | Ground             |   |
| 15                     | Out channels 5/6 + |   |
| 3                      | Out channels 5/6 - |   |
| 16                     | Ground             |   |
| 4                      | Out channels 3/4 + |   |
| 17                     | Out channels 3/4 - |   |
| 5                      | Ground             |   |
| 18                     | Out channels 1/2 + |   |
| 6                      | Out channels 1/2 - |   |
| 19                     | Ground             |   |
| 7                      | In channels 7/8 +  | Inputs.<br>Circuits offset by 8 for each additional connector.  |
| 20                     | In channels 7/8 -  |   |
| 8                      | Ground             |   |
| 21                     | In channels 5/6 +  |   |
| 9                      | In channels 5/6 -  |   |
| 22                     | Ground             |   |
| 10                     | In channels 3/4 +  |   |
| 23                     | In channels 3/4 -  |   |
| 11                     | Ground             |   |
| 24                     | In channels 1/2 +  |   |
| 12                     | In channels 1/2 -  |   |
| 25                     | Ground             |   |
| 13                     | n/c                |   |

Connectors Viewed From Wiring Side



Plug



Socket

Dimensions:55 x 15 mm (approx.)  
Cable Diameter:8 mm (typical)  
Screwlock thread:440-UNC



## Appendix C – Performance Specifications

| <i>Mic/Line Inputs</i>               |   |  |
|--------------------------------------|---|--|
| Parameter                            | Value   | Notes  |
| <b>Gain Range</b>                    | +26 to +70 dB<br>-4 to +30 dB<br>-4 to +40 dB | Mic mode, 0 dBFS, 0.1 dB gain step size<br>Line mode, 0 dBFS, 0.1 dB gain step size<br>Mic mode with pad engaged |
| <b>Maximum Input Level</b>           | +27.5 dBu                                     | 30 dB Pad inserted   |
| <b>Frequency Response</b>            | ± 0.2 dB                                      | Mic mode, 20 Hz – 20 kHz (@48kHz)<br>Typically ± 0.1 dB  |
| <b>Equivalent Input Noise</b>        | < -123 dB                                     | Mic mode, 70 dB gain, A-weighted filter,<br>22 kHz bandwidth.<br>Typically -124 dB                               |
| <b>Usable Dynamic Range</b>          | > 115 dB                                      | Mic mode, 0 dBFS, A-weighted filter,<br>22 kHz bandwidth.<br>Typically 116 dB.                                   |
| <b>Input Impedance</b>               | 2.3 kΩ / 10 kΩ                                | Mic / Line. Selectable per channel   |
| <b>CMRR</b>                          | > 70 dB<br>> 90 dB                            | Mic mode, 20 Hz – 20 kHz, 0 dBu<br>Mic mode, 1 kHz, 0 dBu  |
| <b>Crosstalk</b>                     | > -75 dB<br>> -90 dB                          | 20 Hz – 20 kHz<br>1 kHz  |
| <b>THD+N</b>                         | < 0.01 %                                      | Mic mode, 20 Hz – 20 kHz, -1 dBFS,<br>22 kHz bandwidth.  |
| <b>Phantom Power<br/>(Mic Input)</b> | +48 V ±4 V<br>10 mA                           | Selectable per channel   |
| <b>Pad (Mic Input)</b>               | 30 dB   | Selectable per channel   |
| <b>Operating Levels</b>              | +24, +22, +20,<br>+18, +15 dBu                |  |
| <b>Sample Rates</b>                  | 44.1, 48, 88.2<br>or 96 kHz                   |  |
| <b>Resolution</b>                    | 24 bit  |  |
| <b>Group Delay</b>                   | 19 samples                                    | Analogue to Dante module   |

*Measurement Parameters*

|                        |                                 |
|------------------------|---------------------------------|
| Sample Rate:           | 96 kHz                          |
| Operating Level:       | +24 dBu = 0 dBFS                |
| Mic input termination: | 150 Ω                           |
| Mic Mode Gain:         | 26 dB (unless stated otherwise) |
| Reference frequency:   | 1 kHz (unless stated otherwise) |

| <i>Line Inputs</i>          |                             |  |
|-----------------------------|-----------------------------|--|
| Parameter                   | Value                       | Notes  |
| <b>Maximum Input Level</b>  | +24 dBu                     | 10 k $\Omega$ load   |
| <b>Frequency Response</b>   | $\pm 0.1$ dB                | -1 dBFS, 20 Hz – 20 kHz  |
| <b>Usable Dynamic Range</b> | > 116 dB                    | 0 dBFS, A-weighted filter, 22 kHz bandwidth<br>Typically >117 dB |
| <b>THD+N</b>                | < 0.005 %                   | 20 Hz – 20 kHz, -1 dBFS, 22 kHz bandwidth<br>Typically < 0.004%  |
| <b>Sample Rates</b>         | 44.1, 48, 88.2<br>or 96 kHz |  |
| <b>Resolution</b>           | 24 bit                      |  |

| <i>Line Outputs</i>         |                             |  |
|-----------------------------|-----------------------------|--|
| Parameter                   | Value                       | Notes  |
| <b>Maximum Output Level</b> | +24 dBu                     | 600 $\Omega$ / 10 k $\Omega$ load                                |
| <b>Output Impedance</b>     | < 50 $\Omega$               |  |
| <b>Frequency Response</b>   | $\pm 0.3$ dB                | -1 dBFS, 20 Hz – 20 kHz  |
| <b>Usable Dynamic Range</b> | > 116 dB                    | 0 dBFS, A-weighted filter, 22 kHz bandwidth<br>Typically >117 dB |
| <b>Crosstalk</b>            | < -90 dB<br>< -105 dB       | 20 Hz – 20 kHz, 0 dBFS<br>1 kHz, 0 dBFS                          |
| <b>THD+N</b>                | < 0.01 %                    | 20 Hz – 20 kHz, -1 dBFS. 22 kHz bandwidth<br>Typically < 0.004%  |
| <b>Output Symmetry</b>      | > 40 dB                     | 20 Hz – 20 kHz<br>Typically > 50 dB                              |
| <b>Sample Rates</b>         | 44.1, 48, 88.2<br>or 96 kHz |  |
| <b>Resolution</b>           | 24 bit                      |  |
| <b>Group Delay</b>          | 11 samples                  | Dante module to analogue   |

#### *Measurement Parameters*

Sample Rate: 96 kHz  
 Operating Level: +24 dBu = 0 dBFS  
 Reference frequency: 1 kHz (unless stated otherwise)

| <i>Digital Inputs</i>  |                          |  |
|------------------------|--------------------------|--|
| Parameter              | Value                    | Notes  |
| Input Impedance        | 110 $\Omega$             | Transformer coupled                              |
| Sample Rates           | 44.1, 48, 88.2 or 96 kHz | 32 - 216 kHz with sample rate converters enabled |
| Sample Rate converters | Yes                      | Selectable per AES channel pair                  |
| Resolution             | 24 bit                   |  |

| <i>Digital Outputs</i> |                          |                     |
|------------------------|--------------------------|---------------------|
| Parameter              | Value                    | Notes               |
| Output Impedance       | 110 $\Omega$             | Transformer coupled |
| Sample Rates           | 44.1, 48, 88.2 or 96 kHz |                     |
| Resolution             | 24 bit                   |                     |

## **Appendix D – Safety Notices**

### *General Safety*

1. Please read and keep this document.
2. Adhere to all warnings and follow instructions.
3. This electrical equipment should not be used near water.
4. Cleaning should only be with dry cloths or products compatible with electrical devices – never when the unit is powered.
5. Keep the unit free of dust and use in a clean environment.
6. Do not use near any heat source or in direct sunlight.
7. Do not use near naked flames.
8. Do not place heavy objects on the unit.
9. Only use attachments/accessories recommended by the manufacturer.
10. Unplug the device during lightning storms or long periods of nonuse.
11. The unit can only be serviced by qualified personnel – Seek immediate service if:
  - I. The unit has been exposed to moisture
  - II. The unit has been dropped
  - III. The unit does not operate normally
12. Do NOT modify this unit – alterations may affect performance, safety and/or international compliance standards.
13. SSL does not accept liability for damage caused by maintenance, repair or modification by unauthorised personnel.

### *Installation Notes*

1. When installing this apparatus either fix it into a standard 19" rack or place the apparatus on a secure level surface.
2. When this apparatus is rack mounted, fit all rack screws. Rack shelves are recommended for this apparatus.
3. Allow a 1U gap above and below this apparatus for cooling.
4. Do not obstruct any ventilation cut-outs or exhaust fans.
5. Ensure that no strain is placed on any cables connected to this apparatus. Ensure that all such cables are not placed where they can be stepped on, pulled or tripped over.



**Power Safety**

1. The unit is not supplied with a mains lead allowing you to use IEC distribution of mains cables of your choice. Any mains cable used must fulfill the following:
  - I. Refer to the ratings label on the rear of the unit and always use suitable mains cords.
  - II. The unit should ALWAYS be earthed with the earth on both IEC sockets (when both are used).
  - III. Please use a compliant 60320 C13 TYPE SOCKET. When connecting to supply outlets ensure that appropriate sized conductors and plugs are used to suit local electrical requirements.
  - IV. Maximum cord length should be 4.5 m (15').
  - V. The cord should bear the approval mark of the country in which it is to be used.
2. The appliance coupler is used as the disconnect device, ensure that it is connected to an unobstructed wall outlet.
3. The mains inlets are designed for connection to a single phase AC supply however each inlet can safely be connected to a separate phase of a three phase mains supply. Warning: if connected to separate phases up to 400 V potential phase to phase may be present.
4. The clear markings regarding redundant power supplies detailed on the unit must be transferred into the installation to ensure both power sources are removed before qualified personnel service the unit.

**GB** The apparatus shall be connected to mains socket outlets with a protective earthing connection

**DEN** Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord

**FIN** Laite on liitettävä suojamaadoituskoskettimilla va rustettuumpistorasiaan

**NOR** Apparatet må tikoples jordet stikkontakt

**SWE** Apparaten skall anslutas till jordat uttag



**ATTENTION!** This equipment must be Earthed. Refer to manual for installation instructions.

**CAUTION!** Disconnect all power sources before removing any panel (s). No user-serviceable parts inside – to be serviced only by qualified personnel.



**WARNING!** Un-Earthed metal parts may be present inside enclosure. Check for hazardous voltages before touching.

For protection against risk of fire – replace only with same type / rating of fuse. Do not expose to rain or moisture.

**For EU**

The stagebox is CE compliant and fully conforms with the current protection requirements of the European community council directives on EMC and LVD. Note that any cables supplied with SSL equipment may be fitted with ferrite rings at each end. This is to comply with the current regulations and these ferrites should not be removed. Any modifications to this equipment may adversely affect the CE compliance of this product.

### *Environmental Declaration*



The symbol shown here, which is on the product or its packaging, indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste using a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can dispose of your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

### *RoHS Notice*

Solid State Logic has conformed and this product has conformed to European Union's Directive 2011/65/EU on Restrictions of Hazardous Substances (RoHS) as well as the following sections of California law which refer to RoHS, namely sections 25214.10, 25214.10.2, and 58012, Health and Safety Code; Section 42475.2, Public Resources Code.

### *For USA*

To the User:

1. Do not modify this unit! This product, when installed as indicated in the instructions contained in the installation manual, meets FCC requirements.
2. Important: This product satisfies FCC regulations when high quality shielded cables are used to connect with other equipment. Failure to use high quality shielded cables or to follow the installation instructions may cause magnetic interference with appliances such as radios and televisions and will void your FCC authorisation to use this product in the USA.
3. Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### *Electromagnetic Compatibility*

EN55103-1:2009, EN55103-2:2009 Environments E1, E2, E3 and E4

Typical average initial half-cycle inrush current: 1.3 A. Typical peak inrush current: <5 A.

The audio input/output and network ports are screened-cable ports and any connections to them should be made using braid-screened cable and metal connector shells in order to provide a low impedance connection between the cable screen and the stagebox. All network connections should be of Cat5e standard or above.

### *Environmental*

|                    |                               |                                    |
|--------------------|-------------------------------|------------------------------------|
| <b>Temperature</b> | Operating: +5 to 30 °C        | Storage: -20 to 50 °C              |
| <b>Vibration</b>   | Operating: < 0.2 G (5–200 Hz) | Non-operating: < 0.4 G (5–200 Hz)  |
| <b>Shock</b>       | Operating: < 3 G (11 ms max.) | Non-operating: < 10 G (11 ms max.) |